Message

From: Wirick, Holiday [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CB8297D55F314BDD8AE914EED7EF14E5-HWIRICK]
Sent: 7/27/2021 11:40:14 PM
To: Wax, Peter N. [pwax@nd.gov]
Subject: question re: ammonia criteria equation for acute standard

Hi Pete, please correct me if I'm wrong but it looks like Sarah Waldron's corrected equation for the acute ammonia standard was not used in the final WQS (it looks like the formula from the August 19 email was used here).

From: Wax, Peter N. <pwax@nd.gov>
Sent: Thursday, August 20, 2020 12:09 PM
To: Wirick, Holiday <wirick.holiday@epa.gov>
Subject: FW: NEW Ammonia

This is correct. The one I sent yesterday not so much.

Sarah Waldron (She is a genius) built the equations and matched the USEPA criterion output tables. As a heads up the Oncorhynchus equation in the EPA guidance will not run correctly as written. The one below will (see attachment). Not sure if you get points for finding errors or not but if so I will give you all the credit.

Pete

The Corrected Criteria is:

Acute Standard
The one-hour average concentration of total ammonia as nitrogen in mg/l does not exceed, more often than once every three years on the average, the numerical value given by the following:

Where Oncorhynchus are absent; or

Where Oncorhynchus are present

Chronic Standard
The 30-day rolling average concentration of total ammonia as nitrogen expressed in mg/l is not to exceed, more than once every three years on average, the chronic criteria magnitude calculated using the following formula:

In addition, the highest four-day average within the 30-day averaging period should not be more than 2.5 times the criteria more than once in three years on average.

For a spreadsheet with functional equations contact Peter Wax at pwax@nd.gov or 701-328-5268.

From: Wax, Peter N.
Sent: Wednesday, August 19, 2020 2:57 PM
To: Holly Wirick (wirick.holiday@epa.gov) <wirick.holiday@epa.gov>
Subject: NEW Ammonia

Acute Standard

The one-hour average concentration of total ammonia as nitrogen in mg/l does not exceed, more often than once every three years on the average, the numerical value given by the following:

$$0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.618}{1+10^{pH-7.204}}\right) \times MIN(51.93, 23.12 \times 10^{0.036 \times (20-T)})$$

Where Oncorhynchus are absent; or

$$MIN\left(\left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}\right), \left(0.7249 \times \left(\frac{0.0114}{1+10^{7.488-pH}} + \frac{1.6181}{1+10^{pH-7.488}}\right) \times 23.12 \times 10^{0.036 \times (20-T)}\right)\right)$$

Where Oncorhynchus are present

Chronic Standard

The 30-day rolling average concentration of total ammonia as nitrogen expressed in mg/l is not to exceed, more than once every three years on average, the chronic criteria magnitude calculated using the following formula:

$$0.8876 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times (2.126 \times 10^{0.028 \times (20-\max(T,7))})$$

In addition, the highest four-day average within the 30-day averaging period should not be more than 2.5 times the criteria more than once in three years on average.

Peter N. Wax
Special Projects
Division of Water Quality

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